IJSPT

ORIGINAL RESEARCH

SPORTS PHYSICAL THERAPY CURRICULA IN PHYSICAL THERAPIST PROFESSIONAL DEGREE PROGRAMS

Edward P. Mulligan, PT, DPT, SCS, OCS, ATC[1]
Julie DeVahl, PT, DPT, OCS[1]

ABSTRACT

Background: The specialty niche of sports physical therapy has grown at a significant rate over the past 40 years. Despite this growth there is little information or direction from the physical therapy education accreditation body or professional association to guide academic programs on the interest or necessity of this type of practice content in physical therapy professional degree programs.

Purpose: The purpose of this survey study is to report on the prevalence, attitudes, barriers, resources, and faculty expertise in providing required or elective sports physical therapy course work.

Study Design: Cross-sectional descriptive survey

Methods: A 57-item questionnaire with branching logic was distributed via a web-based electronic data capture tool to survey all Commission on Accreditation for Physical Therapy Education (CAPTE) accredited and candidate schools in the United States. Response data was analyzed to describe typical educational program profiles, faculty demographics, and correlational factors consistent with the presence or absence of specific sports physical therapy curricular content.

Results: Thirty one percent of the schools responded to the survey and the program demographics were consistent with all currently accredited schools in regards to their geography, Carnegie classification, and faculty and student size. Forty three percent of programs offered a required or elective course distinct to the practice of sports physical therapy. Descriptive information regarding the sequencing, curricular make-up, resources, and assessment of content competence is reported. The odds of providing this content nearly doubles for programs that have faculty with sports clinical specialist credentials, accredited sports residency curriculums, or state practice acts that allow sports venue coverage.

Conclusions: This survey provides an initial overview of sports physical therapy educational efforts in professional physical therapy degree programs. The data can used to spur further discussion on the necessity, structure, and implementation of education content that is inherent to a growing specialty practice in the physical therapy profession.

Level of Evidence: 4, Cross-sectional descriptive survey design

Key words: Accreditation, clinical specialization, entry-level education, sports physical therapy

[1] UT Southwestern School of Health Professions, Dallas, TX, USA

Acknowledgments:

The authors would like to acknowledge the efforts of the Katie Lynch, PT, DPT, ATC, a sports physical therapy resident at the time of the study, for her assistance with the development of the survey tool.

We declare that we have no conflicts of interest in the authorship or publication of this contribution.

CORRESPONDING AUTHOR
Edward P. Mulligan
UT Southwestern Medical Center
School of Health Professions
6011 Harry Hines Blvd
Dallas, TX 75235
E-mail: ed.mulligan@utsouthwestern.edu

DOI: 10.16603/ijspt20170787

INTRODUCTION

Sports physical therapy is a specialized subset of physical therapy practice that focuses on the health care management of the physically-active individual that has been injured in or aspires to return to athletic endeavors.[1] The sports physical therapist establishes a customized plan of injury prevention, injury management, or performance enhancement in order to enable or maximize the athlete's participation in sporting activities. Additionally, sports physical therapists have important administrative, educational, and ethical responsibilities to ensure the safety and well-being of the athlete. Performance of these responsibilities requires the sports physical therapist to capably communicate with athletes, coaches, parents, administrators, and other healthcare professionals.[1-3]

Since the inception of the sports physical therapy section in 1973 the interest in management of athletic health care issues has grown at a significant rate in the physical therapy profession. The Sports Physical Therapy Section (SPTS) of the American Physical Therapy Association (APTA), a component member of the APTA, exists to provide a forum in which physical therapists interested in sports-related injuries can share ideas and learn about the unique skills and knowledge that define this area of specialty practice.[4] Currently there are over 8,000 SPTS members (1,500 of which are students) and 1,914 clinicians have been certified as sports clinical specialists by the American Board of Physical Therapy Specialties (ABPTS) since its inception approximately 30 years ago. Many students become interested in a physical therapy career based on their interaction with sports physical therapists during their athletic career. Sports certified specialists were often competitive athletes in their youth (96%) and currently maintain a physically active lifestyle by exercising at least twice per week (97%).[5-6] Additionally, during the 2014-2105 application cycle there were 165 qualified applicants who applied for 81 sports residency positions at 34 accredited programs, indicating that further training and specialization in sports physical therapy is of high interest to clinicians in this competitive physical therapy discipline.[7] Even though there seems to be an emerging need and interest for this area of practice, the Commission on Accreditation for Physical Therapy Education (CAPTE) is silent on the inclusion of curricular content specific to the area of sports physical therapy.

Despite this seemingly high interest in sports physical therapy, the authors are unaware of any published studies that describe education efforts or competence criteria for entry level physical therapist professional preparation programs in the United States (U.S.) for sports physical therapy content. Additionally, the authors are unaware of any publications that would assist a program in developing a sports physical therapy curriculum independent of the ABPTS's description of sports physical therapy practice. Unfortunately, this ABPTS document is intended to describe advanced specialty practice and goes beyond entry-level minimal competence.

The purpose of this survey study is to report on the prevalence, attitudes, barriers, resources, and faculty expertise in providing required or elective sports physical therapy course work. Specific aims are to report the prevalence of programs teaching this content, attitudes or barriers to providing the content, and details regarding the curricular structure, program resources, and faculty expertise that is found at programs that are providing required or elective sports physical therapy course work. These survey results can serve as a curricular benchmark for the profession and spur further discussion on the need, means, obstacles, and benefits to developing sports physical therapy curricula in physical therapy professional degree programs.

METHODS

Tool Development

The model for our survey was based on previous instruments developed to investigate the content and prevalence of curricula to teach manipulative therapy and diagnostic and procedural imaging in physical therapist professional degree programs based in the U.S.[7-10] The broad categories for data capture on the survey included 1) physical therapist program and faculty representative respondent demographics, 2) descriptive information (content, resources, assessment methods, etc.) regarding the program curriculum, and 3) opinions regarding the need and appropriateness of sports physical therapy education in accredited programs. Three physical therapists with unique insights and experiences for

teaching content unique to sports physical therapy content collaborated to draft the original survey tool. These developers included two faculty members with extensive experience in the practice of sports physical therapy and curricular design. The remaining contributor was a dual licensed sports physical therapist resident with one year of experience in both physical therapy and athletic training who reviewed this survey tool and provided feedback.

The initial draft was piloted with six physical therapists with known interest and experience in providing sports physical therapy education. Critique regarding the survey's content, organization, and readability enhanced content validity. Based on the collective input from these experts the survey tool was modified and finalized for distribution.

The final data collection instrument is a 57-item questionnaire with branching logic based on the respondent's answer as to whether or not their institution provided specific curricular content relevant to the practice of sports physical therapy. Programs without sports physical therapy coursework provided input on why this content was not included in their curriculum and what future plans they may have for addition of this content. Programs that offer sports physical therapy content provided information regarding their pedagogical structure, curriculum faculty, and program resources by responding to closed-ended, dichotomous or ordinal-valued questions. All programs provided demographics and the background and training of the individual responding to the survey on behalf of their institution.

Participants

All physical therapist professional degree programs recognized by CAPTE as accredited (n = 219) or candidate (n = 22) were queried for input. The survey invitation was sent via email to the contact addresses listed on the APTA's web site. If the email address was not specific to a faculty member's name, the school's web site was searched for a faculty recipient who appeared to be responsible for orthopedic and/or sports-related academic content. In all instances, the cover letter directed the recipient to forward the survey request to the faculty member most familiar with topics related to sports physical therapy. Based on a 95% confidence level it was calculated that at least 69 responses were needed from the 241 schools to bring the margin of error to within $\pm$ 10%.

Survey Administration

Study data was collected and managed using RED-Cap electronic data capture tools hosted at UT Southwestern Medical Center in Dallas, TX. REDCap (Research Electronic Data Capture, CTSA NIH Grant UL1TR001105) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry, 2) audit trails for tracking data manipulation and export procedures, 3) automated export procedures for seamless data downloads to common statistical packages, and 4) procedures for importing data from external sources. The Institutional Review Board at the University of Texas Southwestern Medical Center reviewed and provided exempt approval of the study protocol.

The study cover letter described the study's purpose, emphasized anonymity through aggregate-only reporting, and stated that voluntary consent was designated by responding to the survey link. After the initial email was extended, follow-up requests were sent at one, two and four weeks. Further requests for participation were stopped as the response rate plateaued over the next week. The survey was open for response during a five-week interval in January and February of 2017.

Data Analysis

Data collected in RED-Cap was imported into an Excel (Microsoft Corporation, Redmond, WA) spreadsheet for statistical analysis. Descriptive statistics were calculated to describe educational program profiles and responding faculty demographics. An on-line program at www.vassarstats.net was used for correlational analysis (Pearson, Point Biserial, and Phi Coefficient) and non-parametric Mann-Whitney analysis of the differences between schools with and without sports physical therapy education curricula.

RESULTS

Of the 241 CAPTE recognized physical therapist programs in the U.S. 74 (31%) responded to our survey. This included 66 of the 219 (30%) accredited and 8 of the 22 (36%) of the developing programs.

Forty-three (61%) of the programs that responded were classified as public universities, 18 (26%) were private not-for-profit institutions, and the remaining 9 (13%) programs were private for-profit programs. Schools from 32 of the 47 states with accredited physical therapy programs are represented in the results. All states with more than three programs have at least one school included in the analysis. (Table 1)

One hundred percent of the faculty representatives responding on behalf of their program were licensed physical therapists. (Table 2) The mean program length (34 months), number of students/class (44), total number of faculty (16), and total number of faculty with clinical specialist credentials were nearly identical to the most current (2015-16) aggregate program data fact sheet provided by CAPTE indicating that the current sample was representative of the population as a whole.[11] The mean number of certified clinical specialists for the respondent programs was 7.5 with over half of those being either orthopedic or sports specialists (3.5 and 1.0 respectively). Additionally, respondent programs averaged approximately one faculty member who was certified as an athletic trainer.

Eighty percent of the respondents indicated that there was an intercollegiate athletic program on their campus with the majority competing at the Division I level. Of those programs that had an athletic program on or near campus, 28% of the programs had a faculty member(s) that provided team coverage or care of athletes on campus or in their community. (Table 1)

Sports Physical Therapy Curricula

Thirty-two (43%) of the programs reported they had a distinct course unique to the roles, skills, and knowledge of sports physical therapy included in their curriculum. Of those schools offering sports physical therapy education, 35% of the programs required this course while 65% offered the content as an optional elective. Twenty-seven (27%) of the programs provided coursework that specifically prepared students for certification as a strength and conditioning specialist. Of the 32 programs that

Table 1. *Demographics of Respondent Physical Therapy Programs (n = 74)*

Accreditation Status	66 Accredited (89%); 8 Developing (11%)
Offer specific course work for Sports Physical Therapy	42 (57%) no; 32 (43%) yes
Offer specific course work for Certification as Strength and Conditioning Specialist	54 (73%) no; 20 (27%) yes
Program Length (mean ± SD, range)	34.1 ± 2.9, 24-37 months
Number of Students/Class (mean ± SD, range)	43.6 + 14.8, 21-85
Number of Core and Adjunct Faculty (mean ± SD, range)	16.4 ± 11.2, 5-75
Legally able to provide athletic venue/field coverage	31 (42%) no; 15 (20%) yes; 28 (38%) unsure
Intercollegiate athletic program on campus	14 (20%) no; 59 (80%) yes
Intercollegiate sports competition level	55% Division I 26% Division II 14% Division III 3% NAIA 2% Club
Faculty provide team coverage	51 (69%) no, 21 (28%) yes; 2 (3%) unsure
Number of Faculty with Specialization Certification Credential	All: 7.5 ± 6.7 OCS: 3.5 ± 5.2 SCS: 1.0 ± 1.2 ATC: 0.8 ± 1.0

Table 2. *Demographic description of faculty members responding to the survey*	
Sex	61% male, 39% female
Age (years) (mean ± SD, range)	47.1 ± 9.6, 28-69
Entry-Level Degree	32% Doctorate, 28% Masters, 32% Baccalaureate, 8% certificate
Highest Level Degree	53% Doctoral, 33% Transitional DPT, 1% Advanced Masters, 13% no further degree
Total Professional Experience (years) (mean ± SD)	22.9 ± 9.9
Sports Physical Therapy Experience (years) (mean ± SD)	15.8 ± 11.3
Academic Setting Experience (years) (mean ± SD)	12.5 ± 9.5
* Section Membership (100% APTA members)	74% Orthopedic 60% Sports 58% Education 18% Research 3% Private Practice
*total is greater than 100% based on multiple section membership for some respondents	

offered sports physical therapy classes, 56% offered strength and conditioning content. Similarly, of the 20 programs that provided strength and conditioning content, 70% also offered sports physical therapy coursework. The majority of sports physical therapy education is provided towards the end of the student's educational tenure with 59% of the programs providing course work in the final year of learning while 38% of programs provided the content during the second year of the program.

For those programs that provided sports physical therapy course, the mean number of contact hours was 23 with a range of 4 to 60. Fifty five percent of class time was categorized as lecture, 39% as laboratory, 4% as independent study, and 2% as field observation. These values would suggest that the typical sports physical therapy class is a one credit hour course. (Table 3)

Curricular content emphasized sports-specific injury evaluation, biomechanics, rehabilitation and prevention strategies, and return to activity testing. Knowledge and skill areas embedded within the description of sports physical therapy practice that received less instructional emphasis included environmental influences, athletic protective equipment, weight and nutritional considerations, injury psychology, and sleep hygiene. Unique patient subsets of the athletic population that were emphasized in the curriculum included the "female" and "overhead" athlete. Conversely, education regarding the management of the "disabled" athlete was a much lower content priority. (Table 4)

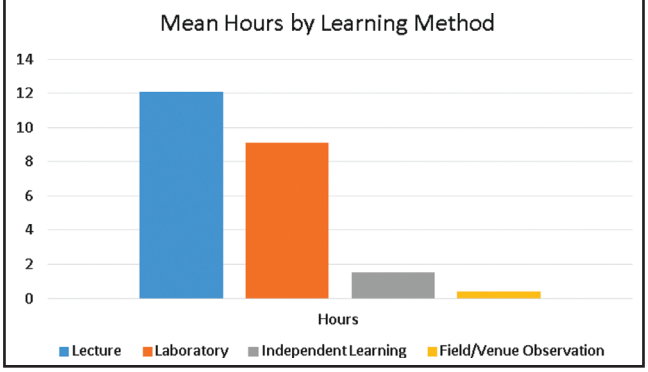
The most common learning supplement used in the sports physical therapy curricula were selected journal articles with 87% of programs reporting that this resource was made available to students. Less frequent resources to accompany class activities were textbooks (32%), internet-based web content (29%), and materials provided by the SPTS of the APTA (29%).

Competence of sports physical therapy concepts were evaluated in a variety of manners but written examination was the most common method of assessment (77%). Project submission was used in 53% of programs. Practical examinations were administered in 47% of programs. Less frequent methods of assessing student's acquisition of sports physical therapy knowledge and skills were simulation exams (10%) and live athlete assessments (3%). There were only a very small percentage of cases where student assessment was not required in the course or that credit was given simply for participation and/or observational time.

The most common reason cited for not providing curricular content specific to sports physical therapy was an overall lack of time in the curriculum (52%).

Table 3. *Contact Hours for Teaching Sports Physical Therapy (n = 32)*

Learning Method	Hours (mean ± SD, range, median)
Lecture	12.1 ± 9.0 (1-30), 10
Laboratory	9.1 ± 8.0 (0-30), 7.5
Independent Learning	1.5 ± 5.6 (0-30), 0
Field/Venue Observation	0.4 ± 1.4 (0-7), 0



Thirty eight percent of the programs did not feel this content was a curricular priority and 29% did not consider this competence to be an entry-level skill. Infrequent reasons for not providing sports physical therapy class work was a lack of funding to hire qualified faculty (12%), inadequate published criteria to guide the curriculum development (7%), or concerns about increasing tuition burden on the students (7%).

Sports Physical Therapy Curriculum Faculty

For programs that provided a sports physical therapy course the curriculum coordinator was a full-time core faculty member 80% of the time. If utilized, the most common additional faculty contributors to the course were guest lecturers (60%) and adjunct faculty (40%). The mean instructor to student teaching ratio for lab based activities was 13.9 ± 7.5 with approximately equal number of programs reporting this ratio as higher, equal, or lower than other coursework in the curriculum.

Factors that Influence Inclusion of Sports Physical Therapy Curricula

There was no difference in the presence of sports physical therapy course based on program accreditation status ($p = 0.83$); program length ($p = 0.22$), number of students/class ($p = 0.78$), number of faculty ($p = 0.58$), number of faculty that are certified orthopedic clinical specialists, collegiate athletic team availability near campus ($p = 0.67$), or number of faculty that were also certified as athletic trainers ($p = 0.29$).

Program demographic factors that did have a significant difference and fair correlation with the presence of a sports physical therapy curriculum were state practice acts that allowed venue coverage ($\phi = 0.28$, $p = 0.04$) and the number of faculty that have a sports clinical specialist certification ($r_{pb} = 0.35$, $p = 0.002$). The odds of a program having a sports physical therapy course nearly doubles (OR = 1.75, 95 CI 0.81-3.76) with the presence of a sports clinical specialist on faculty. Of the 14 American Board of Residency and Fellowship Education accredited sports residencies at the time of the survey that were sponsored by an academic institution, nine responded to the survey. Of these nine, 78% (7) provided an optional or specific sports physical therapy course. There was also a fair correlation between programs that offered a sports physical therapy curriculum and coursework that would specifically prepare the

Table 4. *Inter-rater Reliability Criterion Checklist Scoring.*

Content Area	Number of programs that spend at least one hour of time providing knowledge or teaching skill
Rehabilitation of Sport-Specific Injuries common to Athletics	31 (97%)
Sports -Specific Rehab Strategies and Return to Sports Testing	28 (88%)
Athletic Injury Prevention	27 (84%)
Female Athlete Management	24 (75%)
Overhead Athlete Management	25 (77%)
Sports-Specific Biomechanics (throwing, swimming, biking, running, etc)	24 (74%)
Pre-season Physical Examinations	19 (59%)
Emergency Responder for Acute Athletic Injury or Illness	16 (50%)
Environmental Considerations (hypo/hyperthermia, altitude, lightning)	16 (50%)
Performance Enhancement Drugs, Ergogenic Aids, and Dietary Supplements	17 (52%)
Athletic Protective Equipment or Prophylactic Devices	15 (47%)
Weight Management, Body Composition, and Eating Disorders	13 (41%)
Disabled Athlete Management	9 (28%)
Psychology of Injury Management	8 (25%)
Sleep Hygiene	2 (6%)

students for a strength and conditioning specialist certification (CSCS) ($\phi = +0.33$, $p = 0.01$).

DISCUSSION

To the authors' knowledge these findings provide the first published description of sports physical therapy curricula in U.S. professional degree education programs. Forty three percent of the responding programs provide a specific course for teaching sports physical therapy concepts with another 15% of the programs planning to introduce sports physical therapy content into their curriculum in the next two to three years. By far the two most common reasons for not providing a sports physical therapy course were a "lack of time" in the curriculum (52%) and the content was not considered a curricular priority for inclusion (38%). Less common reasons for not providing sports physical course work were lack of qualified faculty, lack of funding, lack of published guidance to develop a curriculum, or concerns about additional tuition costs for the students. It seems resources are available to provide this education but finite time limitations and/or other curricular priorities prohibit universal instruction in this area of physical therapy practice.

Programs that did not provide a specific course in sports physical therapy were asked to estimate the amount of time that was devoted to teaching sports injury prevention, evaluation, treatment, and performance enhancement specific to the athlete. The mean aggregate time reported was 74 hours suggesting that while there was not a specific course offered in the program, the theme of sports physical therapy

was a curricular thread as this total represents approximately 3-4 hours of educational credit. Much like programs that provided a specific sports physical therapy course the majority of time dedicated to the topic of sports physical therapy concerned the evaluation and management of sport-specific injuries (77% of time). The assumption being that this time was an extension of the broader musculoskeletal perspectives taught in orthopedic course work. A much smaller proportion of time was devoted to skill and knowledge areas that are truly unique to the specialty practice of sports physical therapy. The remaining 23% of time covered athletic injury prevention (9%), performance enhancement (7%), care for the disabled athlete (4%), and acute, "sideline" care (3%). Only 52% of programs that did provide a sports physical therapy course actually included instruction and training in emergency care of life-threatening athletic injuries such as spinal cord trauma, cardiac arrest, heat stroke, internal organ injury, or rhabdomyolysis. This relative lack of focus on venue coverage and emergency responder skills justifies the requirement of emergency medical responder training or experience as an athletic trainer to apply for a sports physical therapy residency position. This type of acute care management knowledge is also important in a much broader context as all physical therapists may encounter life-threatening situations in their occupational and ordinary activities of life in which emergency management skills may be required.

Variability in curricular design was found amongst programs that provided a sports physical therapy course. Class time for lecture and laboratory based-activities averaged 21 hours/semester but ranged from 1-30 hours with a large standard deviation of instructional exposure time (8.5 hours). Suggestions for improving the students' application of sports physical therapy knowledge and skill also varied. The most common recommendation for instructional improvement was increased field/venue exposure for observation (86%). While this method of teaching was not emphasized in many curriculums, it was a significant predictor of a program offering a specific sports physical course ($\phi = 0.28$, $p = 0.04$). Other suggestions for curricular improvement from academic programs included increased lab time (55%), increased lecture time (31%), and involvement of other health care providers (sports physicians 31%; athletic trainers 20%) for instruction. These responses strengthen the rationale for increased multi-disciplinary field exposure for students to strengthen their familiarity with injuries prevalent to athletic competition. It is commonly thought that exposure breeds familiarity and it often takes a significant investment of time to be present when injuries actually occur.

There were also a wide variety of mechanisms used to assess student understanding of content. There was an inconsistent utilization of written and practical exams across programs. Less than half of the programs conducted a practical examination to assess psychomotor skills and even fewer employed simulation testing. Projects or credit for observational time were often used to determine grades and/or class credit. The utilization of written exams is consistent with the current method of testing for both sports physical therapy and athletic training certification which have remarkably similar areas of competency domains.[12] See Figure 1. Despite these similarities is it unknown if this current curricular content or the methods of competency assessment adequately prepare the student for advanced certifications or differentiate their skill and knowledge from other licensed health care providers.

Methods and timing of curricular content delivery seemed more consistent across programs. Full-time faculty members typically coordinated the course and the instructor to student ratio did not differ significantly from other lab-based coursework in the curriculum. There was also a consensus that the curriculum should focus on sports specific injuries and return to play criteria in the female and overhead athlete. Supplementary learning material was largely provided through journal article resources. Twenty three percent of programs did not use any supplementary resources independent of course lecture handouts. Virtually all programs that provide a sports physical therapy course do so later in the curriculum with 30 of the 32 programs waiting until the second or third year of the curriculum. The delayed introduction of this content may suggest that the mastery of this specialty niche requires foundational knowledge and/or familiarity with patient management strategies introduced earlier in physical therapy curricula.

Relevant Weight of Athletic Trainer Exam Question Domains – NATABOC[12]		Relevant Weight of Sports Specialty Practice Competency Categories – ABPTS[1]	
Injury/Illness Prevention and Wellness Protection	25%	Injury Prevention Sports Performance Enhancement	15% 10%
Clinical Evaluation and Diagnosis	22%	Rehabilitation/Return to Sport: Examination, Evaluation, Diagnosis	20%
Immediate and Emergency Care	19%	Acute Injury/Illness Management	15%
Treatment and Rehabilitation	22%	Rehabilitation/Return to Sport: Prognosis, Interventions, Outcomes	20%
		Medical/Surgical Conditions	15%
Organizational and Professional Health and Well-Being	12%	Professional Roles and Responsibilities	5%

Figure 1. *Athletic Training Competency Exam Content and Sports Physical Therapy Comparisons*

Surprisingly, a relatively small percent of programs utilize SPTS resources and this may be an avenue for the SPTS to serve the educational degree programs in a manner similar to the Orthopedic Section's Imaging and Foot/Ankle Special Interest Groups, which have provided imaging education manuals and resource lists.[13-14] Similarly, many specialty sections and academies, including the Clinical Electrophysiology and Wound Care, Geriatrics, Neurology, Pediatrics, and Women's Health of the APTA, have provided compendiums and resources to assist professional-level physical therapist educators with curricular development and delivery guidelines and materials.[15] Since there are no current guideline requirements or recommendations for sports physical therapy from the APTA, the Normative Model of Physical Therapist Professional Education, or in CAPTE's evaluative criteria this type of document could help establish recommendations on the instructional breadth and depth of this content. The SPTS could recruit professional degree and residency program curriculum coordinators to develop resources, clarify legal implications, establish basic curricular content, identify teaching resources, and develop standards of competency assessment that would benefit programs in need of curricular assistance.

The results of this survey indicate that programs generally have the personnel and resources available to implement this sports physical therapy curriculum. Unfortunately, it seems that programs typically have more assets than time to address every specialty practice area relevant to the physical therapy profession. Since all programs may not be able to offer every specialty content areas it may behoove some programs to selectively offer content in which they do have the appropriate faculty, expertise, and facilities. Perhaps programs with sports physical therapy residency programs or clinical specialist faculty with convenient and legal access to athletic venues could be the ideal environment for instructional exposure to sports physical therapy content. In fact, this combination of resources could serve to distinguish one educational program from another and entice potential program applicants.

Future areas of study could include further clarification on how or if "orthopedic" and "sports" physical therapy content overlap in CAPTE accredited professional degree programs. Both specialty areas have strong orthopedic components but one specialty's construct is based on the musculoskeletal physiological system and the other is focused on health care issues specific to an athletic activity environment, avocational, or recreational pursuits.[1,17] Content differentiation may help programs decide if sports physical therapy is an advanced level of proficiency that builds upon general orthopedic skills and knowledge or if it should be considered foundational knowledge that is required of all entry-level providers.

Also, worthy of further study is how program outcomes are affected by the inclusion or exclusion of a specific course on sports physical therapy. Dependent variables that could be evaluated may include the influence of graduate employment setting selection, the impact on sports physical therapy residency/fellowship application and acceptance frequency, or the graduates' success rate on specialty certification examinations.

Despite the array of noteworthy findings, the present study is not without limitations. While the survey concluded with an open-ended question soliciting additional input on any relevant concern it is possible that pertinent information germane to the sports physical therapy education was not collected. Also, the nature of the survey did not allow the respondent to request clarifications on survey questions which allows for the possibility of some items being erroneously interpreted by the respondent. Additionally, information on the precise mechanism by which sports content was embedded into other curricular courses was not solicited nor was how the "sports" content was differentiated from musculoskeletal/orthopedic or strength and conditioning content.

While the response rate of 31% is consistent with many studies evaluating specific components of educational curricula or validation of specialty areas of physical therapy practice it does not represent all programs and has a 10% margin of error. [1, 16-18] It is certainly possible that programs that do not have a curricular emphasis on concepts related to sports physical therapy chose not to respond to our survey request and the results are skewed towards programs with at least some interest in this area of physical therapy practice. Consequently, the results of this study should not be generalized to all CAPTE-accredited physical therapy education programs in the U.S. and only represent an initial description of curricular tendencies in regards to the instruction of sports physical therapy.

CONCLUSION:

This survey provides the first overview of the prevalence of sports physical therapy education in professional degree programs in the U.S. The findings should be used to spur further discussion on the necessity, structure, and implementation of educational content that is inherent to a popular specialty area of practice in the profession. This data can be used to standardize some aspects of content delivery and provide benchmarks for further assessment of the value of teaching sports physical therapy to students as they prepare for a career in the profession.

REFERENCES

1. Mulligan EP, Weber MD, Reinking MF. Competency revalidation study of specialty practice in sports physical therapy. *Int J Sports Phys Ther*. 2014; 9(7):959-73.
2. Zachazewski JE Felder CR Knortz K, et al. Competence revalidation study: A description of advanced clinical-practice in sports physical therapy. *J Orthop Sports Phys Ther*. 1994; 20(2):110-24.
3. Weber MD Thein-Nissenbaum J Bartlett L Woodall WR Reinking MF Wallmann HW Mulligan EP Competency revalidation study of specialty practice in sports physical therapy. *N Am J Sports Phys Ther.* 2009; 4(3):110-22.
4. Sports Physical Therapy Section of the American Physical Therapy Association. What is Sports Physical Therapy? 2012. Available at https://spts.org/about-spts Accessed March 29, 2017.
5. Mulligan EP. Texas Physical Therapy Association Annual Conference – Galveston, TX. Attributes and Attitudes of Board Certified Sports Clinical Specialists. Research Poster Presentation, 2014.
6. Mulligan EP. Texas Physical Therapy Association Annual Conference – Galveston, TX. Attributes, Attitudes, and Specialization Examination Success of Residency-Trained Sports Physical Therapists. Research Poster Presentation, 2014.
7. Boissonnault W, Bryan JM, Fox KJ. Joint manipulation curricula in physical therapist professional degree programs. *J Orthop Sports Phys Ther*. 2004; 34(4):171-8.
8. Boissonnault W, Bryan JM. Thrust joint manipulation clinical education opportunities for professional degree physical therapy students. *J Orthop Sports Phys Ther.* 2005; 35(7):416-23.
9. Boissonnault WG, White DM, Carney S, Malin B, Smith W. Diagnostic and procedural imaging curricula in physical therapist professional degree programs. *J Orthop Sports Phys Ther.* 2014; 44(8):579-86, B1-12.]
10. Noteboom JT, Little C, Boissonnault W. Thrust joint manipulation curricula in first-professional physical therapy education: 2012 update. *J Orthop Sports Phys Ther*. 2015; 45(6):471-6.

11. Harrington K. Aggregate Residency/Fellowship Program and Applicant Data. 2015 Annual Residency/Fellowship Report to the American Board of Physical Therapy Residency and Fellowship Education. Alexandria, VA. 2016.
12. BOC Exam Candidate Handbook. 2017. Available at http://www.bocatc.org/images/stories/candidates/boc%20candidate%20handbook_december2016%20-%20final.pdf. Accessed April 4, 2017.
13. Imaging Education Manual for Doctor of Physical Therapy Professional Degree Programs. 2015. Available at https://www.orthopt.org/uploads/content_files/files/IMAGING_EDUCATION_MANUAL_FINAL_4.15.15.pdf. Accessed April 4, 2017.
14. Foot and Ankle Curricular Guidelines for Physical Therapist Professional Degree Programs. 2015. Available at http://www.apta.org/uploadedFiles/APTAorg/Educators/Curriculum_Resources/Section/FASIG_Curricular_Guidelines_June_24.pdf.
15. APTA Section Curriculum Resources for PT and PTA Educators. 2017. Available at http://www.apta.org/educators/curriculum/section/.
16. Nelson PR, Boissonnault JS, Ankerson K, Figures C, Dockter MK. Survey on curricular content for doctor of physical therapy guidelines for women's health content in professional physical therapist education: 2014 update. *J Womens Health Phys Ther*. 2016; 40(2):61-76.
17. Johanson MA, Miller MB, Coe JB, Campo M. Orthopaedic Physical Therapy: Update to the Description of Specialty Practice. *J Orthop Sports Phys Ther*. 2016; 46(1):9-18.
18. Pullen SD, Bruns EL, Dawkins NG, Powell HV, Miller CM, Sperle CR. HIV-related content in physical therapist education program: A curricular needs assessment. *J Phys Ther Educ.* 2017; 31(1):80-85.